P15829SE00.ale
2000-05-24

Claims

1. A method for producing a fluid-pervious fabric (101; 201; 301; 401) for imparting a pattern (502, 502', 502") to a fibre web (503), said fabric comprising at least one polymer material with a softening temperature, a first surface (104: 204; 304; 404), a second surface (105: 205; 305; 405) opposite said first surface, and a fabric structure (106: 206; 306; 406) comprising a plurality of channels providing fluid permeability between said first and said second surfaces, wherein said second surface (105: 205; 305; 405) is brought into contact with an essentially rigid support (107: 207; 307) having a fabric-contacting side (108: 208; 308) with first fabric patterning members (109, 109': 209, 209'; 309, 309') in a desired configuration and a backside (110: 210; 310) opposite said fabric-contacting side, characterized in that the fluid-pervious fabric (101'; 201'; 301') is heated to a temperature higher than said softening temperature, and that a forming pressure (Δp_1; Δp_2; Δp_3) is applied between said first surface (104: 204; 304) and said second surface (105: 205; 305), so that said first fabric patterning members (109, 109': 209, 209'; 309, 309') contribute to a deformation of said fabric structure (106: 206; 306; 406) in the Z-direction in deformation zones (111, 111', 111"; 211; 311; 411, 411', 411") in which said fluid permeability remains essentially unchanged, whereafter said fluid-pervious fabric (101; 201; 301; 401) is cooled down to a temperature lower than said softening temperature in order to render said deformation in the Z-direction permanent.

2. A method according to claim 1, characterized in that the forming pressure (Δp_1) is created by means of first and second press surfaces (108, 112) arranged in order to form a press nip, wherein said first fabric patterning members (109, 109') are provided on said first press surface (108) being part of said support (107), and are cooperating with inverse, second patterning members (113, 113') on said second press surface (112).

3. A method according to claim 1 or 2, characterized in that heating means are provided in at least one of said press surfaces (108, 112) and heat said fabric structure (106) at least in positions intended to become said deformation zones (111, 111').

4. A method according to claim 2 or 3, characterized in that the fluid-pervious fabric is preheated before said deformation in the Z-direction.

5. A method according to any one of claims 2 - 4, characterized in that at least one of said press surfaces (108, 112) is provided on a rotatable embossing roll.

6. A method according to any one of claims 2 - 5, characterized in that the second fabric patterning members (113, 113') are provided on a single point deforming means programmed for generating said deformation in a chosen configuration across at least one of said surfaces of said fluid-pervious fabric contacting said support.

7. A method according to claim 1, characterized in that the forming pressure is created at least partially by means controlling the pressure in a fluid provided on at least one side of a flexible and elastic, fluid-impermeable membrane, which in cooperation with said first fabric patterning members causes said deformation in the Z-direction of the fluid-pervious fabric.

8. A method according to claim 1, characterized in that also said support (207; 307) is fluid-pervious, wherein a fluid of a higher temperature than said softening temperature is passed through said channels of said fluid-pervious fabric (201'; 301') and through said support (207; 307) at a flow rate (F_2; F_3) sufficient for generating said forming pressure (Δp_2; Δp_3) and causing said deformation in the Z-direction.

9. A method according to claim 8, characterized in that a flexible and elastic membrane (314) with a lower fluid permeability than said fabric structure is brought into contact with said first surface (304) of said fluid-pervious fabric (301'), and that said fluid is passed through said membrane (314), said fabric (301') and said support (307), wherein said membrane (314) provides a contribution to said forming pressure (Δp_3).

10. A method according to any one of claims 7 - 9, characterized in that the support comprises a heating zone in which said fluid is added for heating said fabric and creating said forming pressure.

11. A method according to any one of claims 7 - 10, characterized in that the support comprises a cooling zone subsequent to said heating zone.

12. A method according to any one of claims 7 - 11, characterized in that the fluid-pervious fabric is heated with heated air before said deformation in the Z-direction, and that the fluid-pervious fabric thereafter is cooled down with cooled air in order to render said deformation permanent.

13. A method according to any one of claims 7 - 12, characterized in that the support is a rotatable, cylindrical roll.

14. A method according to any one of claims 7 - 13, characterized in that the support comprises a sintered metallic material or a metal wire.

15. A fluid-pervious fabric for imparting a pattern to a fibre web, said fabric (401) comprising at least one polymer material with a softening temperature, a first surface (404), a second surface (405) opposite said first surface, and a fabric structure (406) comprising a plurality of channels providing fluid permeability between said first and said second

surface, characterized in that the fluid-pervious fabric (401) exhibits a permanent deformation of said fabric structure (406) in the Z-direction in deformation zones (411, 411', 411") in which said fluid permeability is essentially equal to the fluid permeability in fabric zones outside said deformation zones.

16. A fluid-pervious fabric according to claim 15, characterized in that the polymer material exhibits portions which have been softened and subsequently solidified in the deformation zones (411, 411', 411").

17. A fluid-pervious fabric according to claim 15 or 16, characterized in that the fluid-pervious fabric (401) exhibits said deformation in a chosen configuration across at least one of said surfaces (404, 405).

18. A patterned fibre web, comprising a plurality of fibres arranged in a fibre structure (515) having a grammage and a porosity, characterized in that the fibre web (503) exhibits a deformation of said fibre structure (515) in the Z-direction in deformation zones (502, 502', 502"), wherein the grammage and the porosity within said deformation zones are essentially equal to the grammage and the porosity outside the deformation zones.

19. A patterned fibre web according to claim 18, characterized in that the deformation zones (502, 502', 502") are visible as a chosen pattern across both surfaces (516, 517) of said fibre web (503).

20. A patterned fibre web according to claim 18 or 19, characterized in that the fibre web (503) has been wet-formed or foam-formed.

21. A patterned fibre web according to claim 18 or 19, characterized in that the fibre web has been air-laid.

22. A patterned fibre web according to any one of claims 18 - 21, characterized in that the fibre web has been hydraulically apertured or entangled.

23. A patterned fibre web according to any one of claims 18 - 22, characterized in that the fibre web has been through-air dried (TAD).

24. A patterned fibre web according to any one of claims 18 - 23, characterized in that the pattern (502, 502', 502") in the fibre web (503) has been created by means of forming and/or patterning/aperturing on, and/or drying or shaping in contact with at least one fluid-pervious fabric (401) according to any one of claims 15 - 17.